

WHAT IS CLAIMED IS:

1. A lubricating and breather system in an engine having a crankcase and a cylinder block adapted for use in either a horizontal-type or vertical-type engine, and a crankshaft having first and second journal portions, the crankcase having first and second bearing bosses supporting the first and second journal portions of the crankshaft, wherein the first and second bearing bosses are positioned such that the second bearing boss lies above the first bearing boss when the engine is of the vertical-type, wherein:

the lubricating and breather system comprises an annular chamber in the second bearing boss for receiving splashed oil produced in the crankcase;

a breather chamber which is in one side of the cylinder block communicating with the annular chamber to separate gas and liquid, the breather chamber having a first return bore located at a portion thereof which is a lowermost portion when the engine is a horizontal-type, for communicating with the inside of the crankcase, and a second return bore located at a portion thereof which is a lowermost portion when the engine is a vertical-type, for communicating with the inside of the crankcase; and

a breather tube adapted to be operatively coupled to an intake system of the engine and connected to a portion of the breather chamber, said breather chamber being located above the first return bore when the engine is a horizontal-type and above the second return bore when the engine is a vertical-type;

the improvement comprising:

a cap secured over the second bearing boss and cooperating with the bearing boss to define the annular chamber, said cap having a plurality of ribs formed thereon that serve to reduce an amount of the liquid, which is entrained in the gas, that is communicated from said annular chamber to said breather chamber.

2. The lubricating and breather system according to claim 1, wherein the second bearing boss includes an oil feed hole through which gas and liquid are introduced from the crankcase into the annular chamber, and a plurality of oil return holes through which oil is returned from the annular chamber to the crankcase, said oil return holes having a smaller diameter than a diameter of said oil feed hole.

3. The lubricating and breather system according to claim 2, wherein said second bearing boss further includes a plurality of oil sumps, each of said oil sumps being associated with one of said oil return holes and being adapted to retain an amount of oil therein.

4. The lubricating and breather system according to claim 1, wherein said ribs include a plurality of radial ribs and an annular rib.

5. The lubricating and breather system according to claim 4, wherein the second bearing boss includes an oil feed hole through which gas and liquid are introduced from the crankcase into the annular chamber, and a plurality of oil return holes through which

oil is returned from the annular chamber to the crankcase, said oil return holes having a smaller diameter than a diameter of said oil feed hole.

6. The lubricating and breather system according to claim 5, wherein said second bearing boss further includes a plurality of oil sumps, each of said oil sumps being associated with one of said oil return holes and being adapted to retain an amount of oil therein.

7. The lubricating and breather system according to claim 2, further comprising a breather passage extending between said breather chamber and said annular chamber, and wherein an inlet to said breather passage is formed in said second bearing boss at a location that is radially opposite to a location of said oil feed hole.

8. The lubricating and breather system according to claim 7, wherein said ribs include a plurality of radial ribs and an annular rib.

9. The lubricating and breather system according to claim 8, wherein the second bearing boss includes an oil feed hole through which gas and liquid are introduced from the crankcase into the annular chamber, and a plurality of oil return holes through which oil is returned from the annular chamber to the crankcase, said oil return holes having a smaller diameter than a diameter of said oil feed hole.

10. The lubricating and breather system according to claim 9, wherein said second bearing boss further includes a plurality of oil sumps, each of said oil sumps being associated with one of said oil return holes and being adapted to retain an amount of oil therein.

11. A cap that is disposed around an upper end of a crankshaft on an engine having a vertically-oriented crankshaft, said cap being generally annular and cooperating with a bearing boss supporting the crankshaft upper end to define an annular chamber, said annular chamber being adapted to receive blow-by gas from a crankcase of the engine, said cap including:

an annular metal body;

an oil seal extending from said annular metal body and adapted to sealingly engage the crankshaft;

a plurality of ribs formed on an inner surface of said annular metal body, said ribs serving to disrupt flow of a fluid stream introduced into the annular chamber so as to permit oil entrained in the fluid stream to be removed therefrom.

12. The cap according to claim 11, wherein said ribs include a plurality of radial ribs and at least one annular rib.

13. A bearing boss for a vertically-oriented crankshaft on an engine, said bearing boss being disposed relatively above a crankcase of the engine and being adapted to rotatably support an upper end of the crankshaft, said bearing boss including:

an oil feed hole having a first diameter and through which a fluid stream is introduced from the crankcase into an annular chamber disposed on an outer side of said bearing boss;

a plurality of oil return holes having a second diameter and through which oil flows from said outer side of said bearing boss to the crankcase, wherein said second diameter is smaller than said first diameter.

14. The bearing boss according to claim 13, further comprising a plurality of oil sumps, each of said oil sumps being associated with one of said oil return holes and being adapted to retain an amount of oil therein.

15. The bearing boss according to claim 14, wherein an inlet to a breather passage is formed in said bearing boss at a location that is radially opposite to a location of said oil feed hole.